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U S D A FOREST SERVICE RESEARCH NOTE RM-169

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ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

Abert's Squirrels Prefer Mature Ponderosa Pine

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Measurements from 538 ponderosa pines with squirrel clippings underneath showed squirrels preferred trees 11 to 30 inches diameter, breast height. The smallest tree with clippings was 4 inches; the largest, 36. Average diameter of all trees used was 19 inches.

KEY WORDS: *Sciurus aberti*, *Pinus ponderosa*, forest-wildlife relations.

The Abert's squirrel (*Sciurus aberti aberti* Woodhouse) is gaining in popularity as a small game animal in Arizona. Statistics published by the Arizona Game and Fish Department show squirrel hunters have increased from 6,071 in 1962 to 10,683 in 1969.²

In Arizona, the Abert's squirrel is restricted to the ponderosa pine (*Pinus ponderosa* Lawson) forest at elevations from 5,500 to 8,500 feet, and is dependent on ponderosa pine for food and cover

¹Research Wildlife Biologists, located at Tempe, in cooperation with Arizona State University; the Station's central headquarters is at Fort Collins, in cooperation with Colorado State University.

²Arizona Game and Fish Department. Arizona small game investigations. Tree squirrel management information. P-R Project W53R19-WP3-J3. Reports for 1963-69.

(fig. 1).³ Ponderosa pine on commercial land in public ownership in Arizona amounts to 3,515,000 acres.⁴

Management of the Abert's squirrel under multiple use concepts depends upon a knowledge of its life history and habitat requirements. Life history and general habitat preferences have been documented by Keith.³ This Note reports the results of a study to determine preference for tree size.

³Keith, James O. The Abert squirrel and its dependence on ponderosa pine. *Ecology* 46: 150-163. 1965.

⁴Spencer, John S., Jr. Arizona's forests. U. S. Forest Serv. Resource Bull. INT-6, 56 p. Intermt. Forest and Range Exp. Sta., Ogden, Utah. 1966

Figure 1.--Abert's squirrel habitat in ponderosa pine.



Study Area

The Castle Creek watershed, where the study was conducted, is located at an elevation of approximately 8,000 feet, 12 miles southwest of Alpine, Arizona. Ponderosa pine, the dominant tree species on the watershed, is found in small groups of even-aged reproduction, saplings, poles, and sawtimber. Stands are irregularly spaced, characteristic of an all-aged forest.

The pine forest in Castle Creek watershed is typical of forest land between 7,500- and 8,500-foot elevation in the White Mountains. At the higher elevations it is close to the altitude of the

mixed conifer, and has representative vegetation of that zone in the pine type. Douglas-fir (Pseudotsuga menziesii (Mirb.) Franco), white fir (Abies concolor (Gord. and Glend.) Lindl.), southwestern white pine (Pinus strobiformis Engelm.), and quaking aspen (Populus tremuloides Michx.) are found on the cool, moist, north-facing slopes.

Methods

The watershed was inventoried in 1964 by means of a systematic sample with random starts. Transects were installed with sample points spaced at 440-foot intervals. Each transect had from 25 to 50 points, depending on transect length.

The inventory stakes were used as a reference to delineate a half-acre rectangular plot extending the distance between the sample points. Trees on the plots with squirrel cuttings underneath were recorded by diameter breast height (d.b.h.). Trees with squirrel nests were recorded without reference to plots or transects (fig. 2). Data were collected each October from 1964 to 1968.

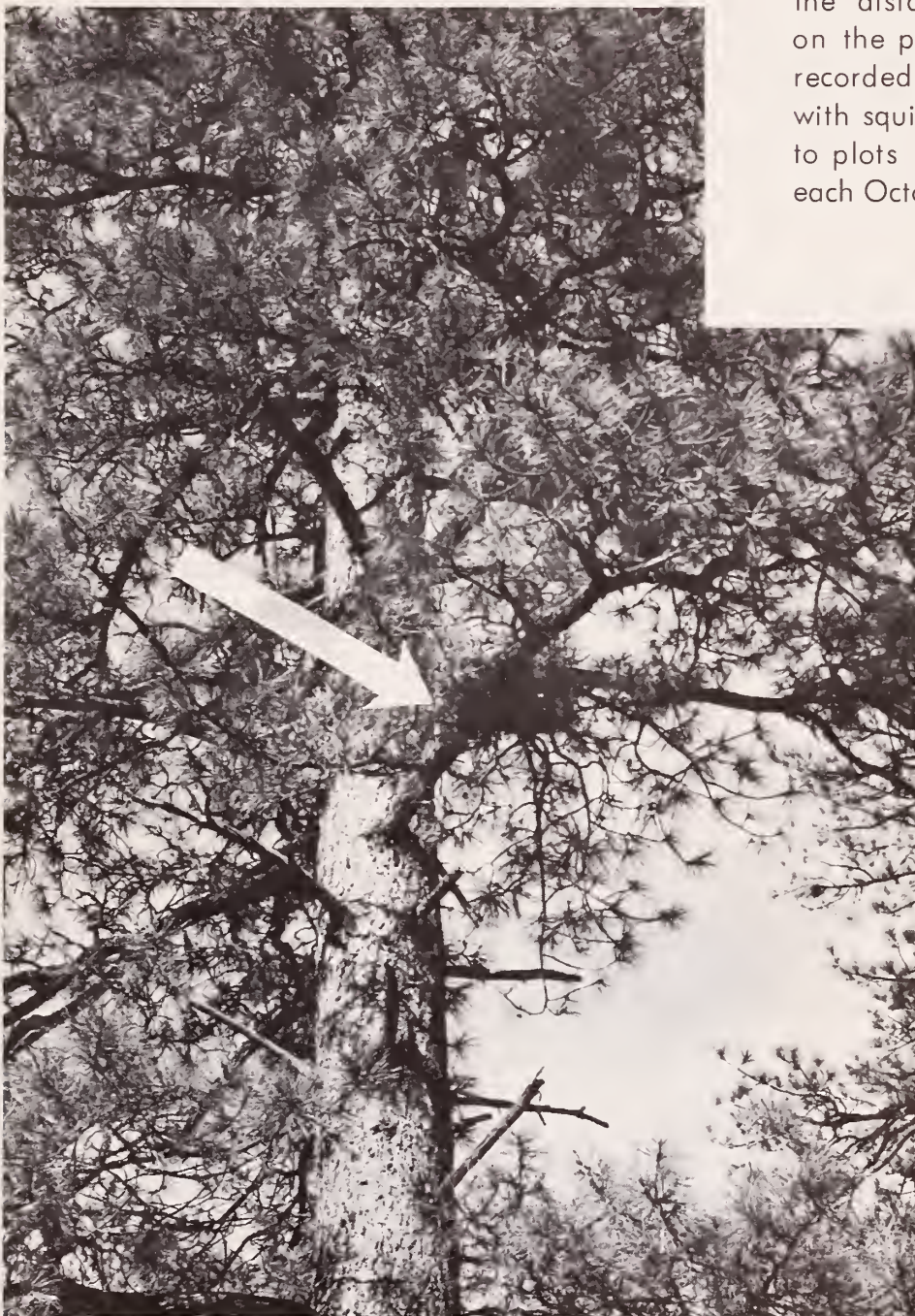


Figure 2.--
Abert's squirrel
leaf nest in a
ponderosa pine.

Results

Of 538 ponderosa pines with squirrel cuttings underneath, the smallest tree was 4 inches, the largest was 36 inches, and the average of all trees with clippings was 19 inches d.b.h. A grouping in the 11- to 30-inch d.b.h. range accounted for 89 percent of the total trees used by the squirrels (table 1).

Squirrel nests made from leaves and branches were found in 10 ponderosa pines that averaged 17 inches d.b.h. The smallest tree with a leaf nest was 10 inches; the largest, 24 inches d.b.h. Smaller trees with nests generally were surrounded by larger, closely spaced trees. All nests were protected from above and to the side but not necessarily from below.

In four instances, squirrels were observed living in hollow Gambel oaks (Quercus gambelli Nutt.). All oaks were mature with over 10 inches d.b.h. Use of species other than ponderosa pine is not uncommon. Reynolds⁵ recorded use of pinyon pine (Pinus edulis Engelm.) by the Abert's squirrels at Fort Bayard, New Mexico.

Management Implications

Although there is some use of other tree species, the Abert's squirrel is closely associated with and depends on ponderosa pine for food and cover. Data from Castle Creek watershed suggest squirrels are most closely associated with mature ponderosa pine in the range of 11 to 30 inches d.b.h. Thus, a segment of the Abert's habitat has been identified, at least tentatively.

Forest wildlife managers in the Southwest can use this basic information in conjunction with timber inventory data to prepare management plans. By delineating ponderosa pine stands in the 11- to 30-inch d.b.h. class on a type map, the preferred habitat of Abert's squirrels will be identified for that particular management unit.

Table 1.--Frequency distribution of diameters from 538 ponderosa pines used by Abert's squirrels, Castle Creek watershed, 1964-68

Diameter class (Inches)	Number of trees used	Percent of total	
1 - 5	2	0.4	} 6.7
6 - 10	34	6.3	
11 - 15	87	16.2	} 89.6
16 - 20	206	38.3	
21 - 25	123	22.9	
26 - 30	66	12.2	
31 - 35	15	2.8	} 3.7
36 - 40	5	.9	
Total	538	100	

⁵Reynolds, Hudson G. 1966. Abert's squirrel feeding on pinyon pine. J. Mammal. 47: 550-551. 1966.

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